ZY-TP21

Mobile Printer

UM01010101　　　V1.02　　　Date: 2012/09/03　　　**User Manual**

Item	Contents
Terms	ZY-TP21 Mobile Printer
Abstract	This document provides an introduction about ZY-TP21 Printer and describes how to use it.

Revision History

Version	Rev. Date	Modifications
V1.00	2012-07-20	Translated to English
V1.01	2012-08-01	Modify "Table 3-1: Printer parameters" and "Table 3-5: Lithium battery parameters"
V1.02	2012-09-03	Added pictures to "2.1.1 Installation of battery", added "2.1.2 Open paper roll box"

Sales Information

Guangzhou ZLG MCU Technology Co., Ltd.

Address: Room F4, 12 Floor, Everbright BANK Building, 689 Tianhe Northern Road,

Guangzhou, CHINA, Post code: 510630

TEL: +86-20-38730916, 38730917, 38730976, 38730977

FAX: +86-20-38730925

Website: www.zlgmcu.com

Guangzhou Sales Office
Address: Room 203 & 204, XinSaiGE Electronic Building, Tianhe District, Guangzhou, CHINA
TEL: +86-20-87578634, 87569917
FAX: +86-20-87578842

Beijing Sales Office
Address: Room 1207~1208, Yingwang Centre, 113 Zhichun Road, Haiding District, Beijing, CHINA
TEL: +86-10-62536178, 62536179   82628073
FAX: +86-10-82614433

Hangzhou Sales Office
Address: Room 502, Jiangnan Electronics Building, No.217 Tianmushan Road, Hangzhou, CHINA
TEL: +86-571-89719480, 89719481, 89719482
+86-571-89719483, 89719484, 89719485
FAX: +86-571-89719494

Shenzhen Sales Office
Address: Room D, Floor 4, C Side, Dianzikeji Building, 2070 ShenNanZhong Road, Shenzhen, CHINA
TEL: +86-755-83781788 (line 5)
FAX: +86-755-83793285

Shanghai Sales Office
Address: Room 7E, Eastern side, Kejijingcheng Building, 668 Beijingdong Road, Shanghai, CHINA
TEL: +86-21-53083452, 53083453, 53083496
FAX: +86-21-53083491

Nanjing Sales Office
Address: Room 1501, Zhujiang Building, 280 Zhujiang Road, Nanjing, CHINA
TEL: +86-25-68123901, 68123902
FAX: +86-25-68123900

Chongqing Sales Office
Address: Room 1611, Saige electronics market, Daxiyang International Building, 2 Keyuanyi Road, Shiqiao, Chongqing, CHINA
TEL: +86-23-68796438, 68796439
FAX: +86-23-68796439

Chengdu Sales Office
Address: Room 403, Electronics & Technology Building, No.1 Southern section 2, Yihuan Road, Chengdu, CHINA
TEL: +86-28-85439836, 85437446
FAX: +86-28-85437896

Wuhan Sales Office
Address: Room 12128, Huazhong Computer and electronics market, 158 LuoYu Road, GuangFouTun, HongShan District, Wuhan, CHINA
TEL: +86-27-87168497, 87168297, 87168397
FAX: +86-27-87163755

XiAn Sales Office
Address: Room 1201, Pacific Building, 54 Changanbei Road, XiAn, CHINA
TEL: +86-29-87881296, 83063000, 87881295
FAX: +86-29-87880865

Technical Supports

Guangzhou ZHIYUAN Electronics Stock Co., Ltd.

Address: Floor 2, Building No.3 Huangzhou Industrial Estate, Chebei Road,

Tianhe District, Guangzhou, CHINA, Post code: 510660

FAX: +86-20 38601859

Website: www.embedtools.com www.embedcontrol.com www.ecardsys.com

Technical Supports

CAN-bus
TEL: +86-20-22644381, 22644382, 22644253
E-mail: can.support@embedcontrol.com

iCAN & Data collection
TEL: +86-20-28872344, 22644373
E-mail: ican@embedcontrol.com

MiniARM
TEL: +86-20-28872684, 28267813
E-mail: miniarm.support@embedtools.com

Ethernet
TEL: +86-20-22644380, 22644385
E-mail: ethernet.support@embedcontrol.com

Wireless Communication
TEL: +86-20-22644386
E-mail: wireless@embedcontrol.com

Serial Communication
TEL: +86-20-28267800, 22644385
E-mail: serial@embedcontrol.com

Programmer
TEL: +86-20-22644371
E-mail: programmer@embedtools.com

Analyze Tools & Instrument
TEL: +86-20-22644375, 28872624, 28872345
E-mail: tools@embedtools.com

ARM Embedded System Application
TEL: +86-20-28872347, 28872377,
22644383, 22644384
E-mail: arm.support@zlgmcu.com

Building Automation
TEL: +86-20-22644376, 22644389, 28267806
E-mail: mjs.support@ecardsys.com

Sales Contact
TEL: +86-20-22644249, 22644399, 22644372, 22644261, 28872524,
+86-20-28872342, 28872349, 28872569, 28872573, 38601786

Repair and rework
TEL: +86-20-22644245

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Chapter 1: Overview

1.1 Introduction

ZY-TP21 is a mobile printer developed by Guangzhou ZLG MCU Technology Co., Ltd. Its simple operation and flexible application make it a good choice for mobile printers.

Features:

- Larger size paper roll box: support up to 40mm diameter paper rolls.
- Double charge mode: USB charge or charger charge.
- Configurable auto sleep and shutdown mode: user can configure auto sleep time, enable or disable auto shutdown function.
- Dedicated Bluetooth tag printer:
  - Dedicated tag boundary detection, don't need to print out a black tag first.
  - Dedicated tag printing commands to suit for different types of tag paper, simplify tag printing works.
- Bluetooth binding function, allow only one specified host to control the printer, avoid interference from other Bluetooth hosts.

1.2 Appearance

Figure 1-1 shows the appearance of the printer.
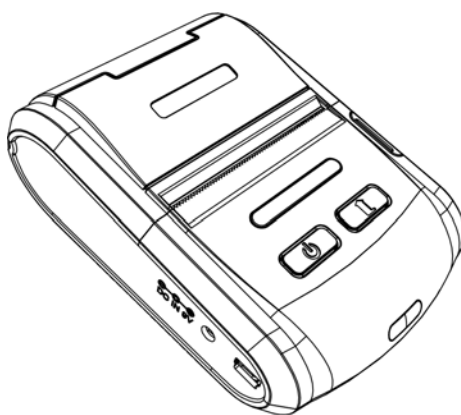
Figure 1-1: Appearance of ZY-TP21 printer

1.3 Accessories

1.3.1 Standard included items

The standard included items are:

- 1 lithium battery
- 1 charger
- 1 printer paper roll
- 1 waist pack

Notes: *If any of these item is missing or broken, please contact your supplier*

1.3.2 Optional items

The optional item is a USB communication cable (Mini port to A port)

Figure 1-2: Optional item

Notes: *For more details about the optional item, please contact your supplier*

1.4 Description of the printer parts
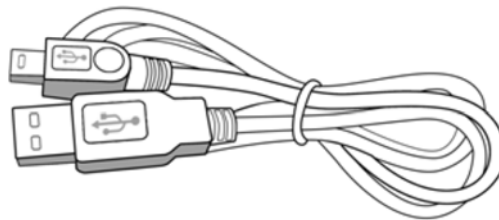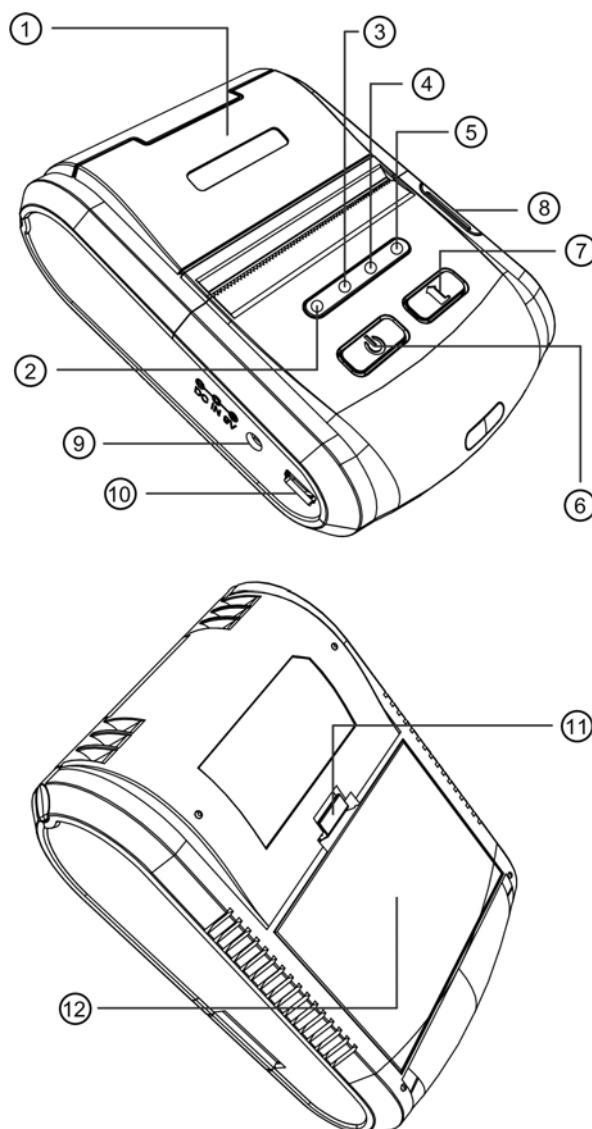

Figure 1-3: Each part of the printer

The descriptions for each part of the printer labeled in Figure 3-1 are listed in Table 1-1.

Table 1-1: Description for each part of the printer

Label	Name	Description
①	Printer paper cover	Cover for paper roll
②	Power indicator	Light up indicates the printer is working normally
③	Bluetooth indicator	Indicates the status of Bluetooth connection
④	Error indicator	Indicates whether error state exists
⑤	Charger indicator	Indicates the power charging state
⑥	Power button	Hold down for a while to turn on the printer
⑦	Feed button	Feed paper button
⑧	Open paper cover button	Press to open the paper cover
⑨	Charger port	Connect to the charger for charging

Label	Name	Description
⑩	USB port	USB communication or charging
⑪	Open battery cover button	Open battery cover
⑫	Battery cover	Battery cover

Chapter 2: Instruction of Usage

2.1 Installation

2.1.1 Installation of battery

The procedure to install the battery is listed as below:

1. Open the battery cover, as Step A in Figure 2-1 shows.

2. Put the battery into the battery box; notice that the polarity and position of the battery should be correct as Step B in Figure 2-1 shows.

3. Close the battery cover, as Step C in Figure 2-1 shows.
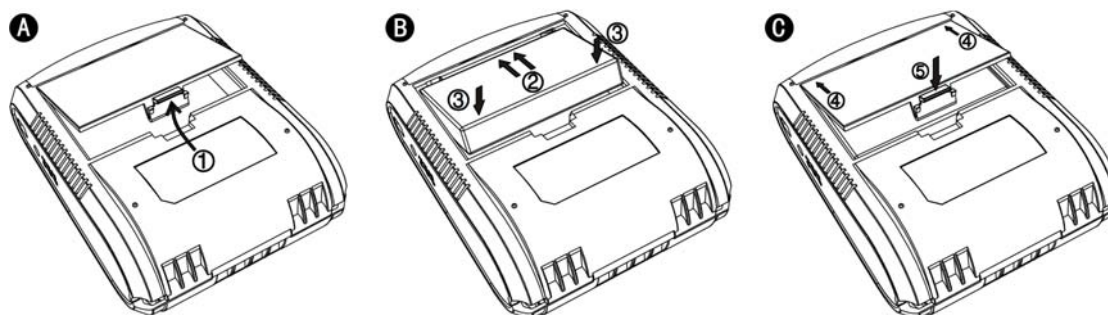
Figure 2-1: Installation of battery

Notes: *Please follow the instructions and figures in section 2.1.1 to install the battery, the warranty of the product does not cover damages caused by operations that did not followed the specifications*

2.1.2 Open paper roll box

The procedure to open the cover of paper roll box is listed as below:

1. Hold the printer in hand.

2. Press the open button for paper roll box, and use another hand pull up the cover of the paper roll box, as Figure 2-2 and Figure 2-3 shows.
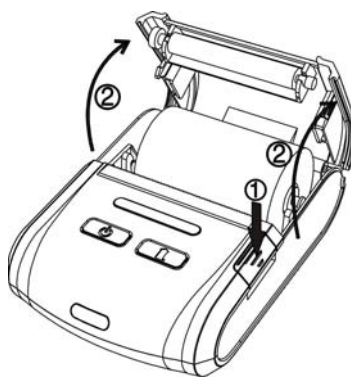
Figure 2-2: Open paper roll box
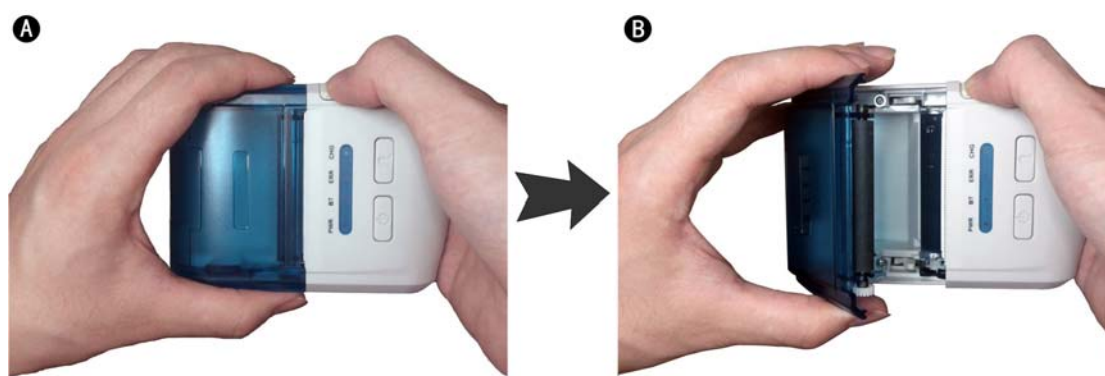
Figure 2-3: How to open paper roll box

Notes: *Please follow the instructions and figures in section 2.1.2 to open the paper roll box, the warranty of the product does not cover damages caused by operations that did not follow the specifications.*

2.1.3 Installation of paper roll

The steps to install a new paper roll on the printer are listed below:

1. Press the open paper cover button to open the paper cover

2. Put a new paper roll (Width: 58mm, diameter of the roll: < 40mm) into the paper roll box, notice the direction of the paper roll should be correct, as Figure 2-4 shows, wrong direction of the paper roll will cause the printer cannot print out anything.

3. Drag out a small potion of paper

4. Fix the paper roll to its correct position then close the paper cover.

Figure 2-4: Correct paper roll direction for installation

2.2 Turn on the printer

Hold down the power button for about 3 seconds, then the power indicator LED "PWR" will light up and buzzer will give out a beep to indicate that the printer is powered up.

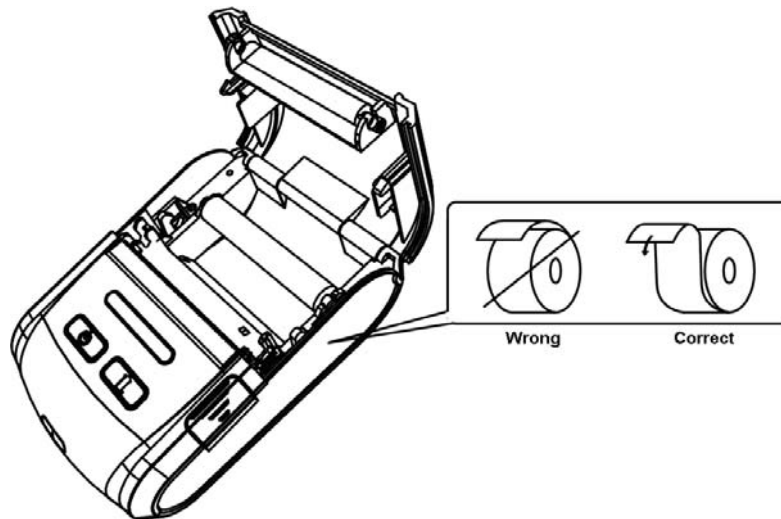> **Notes:** *Don't release the button before power LED lights up and buzzer beep, or else the power up procedure will be failure*

2.3 Turn off the printer

During the normal running state, hold down the power button until the power indicator turns off; then the printer is shutdown, the hole procedure takes about 3 seconds.

2.4 Feed paper

During the normal running state (the ERR error indicator remains off), press the feed button, the printer will then feed in paper.

2.5 Auto sleep

When there is no printing operation after a period of time, the printer can enter sleep mode automatically after a period of time, this can reduce the power consumption and bring more convenience for its usage.

The delay for auto sleep is configurable; its options are listed below:

● Sleep time: 5 mins (After 5 minutes' wait, if still there is no operation, the printer will enter sleep mode automatically)

● Sleep time: 10 mins (After 10 minutes' wait, if still there is no operation, the printer will enter sleep mode automatically)

● Sleep time: 20 mins (After 20 minutes' wait, if still there is no operation, the printer

will enter sleep mode automatically)

The default setting of the sleep mode is off; to configure it, please refer to Section 2.9.2.2

2.6 Wake up from sleep mode

After entering sleep mode, the printer cannot communicate. If user wants to wake up the printer, just press the power button, during the sleep mode, hold down the power key, until the buzzer beeps can wake up the printer from sleep mode.

2.7 Auto shutdown

To further reduce the power consumption, user can activate the "Auto shutdown" function; it has two options, which are:

● Auto shutdown: on (after 1 hour's waiting, if still there is no operation, the printer will be shutdown automatically)

● Auto shutdown: off (Do not automatically shutdown the printer)

The default setting is "Auto shutdown: off", to configure this function, please refer to Section 2.9.2.2.

2.8 Charge

The printer can charge its battery in OFF state. During the power charging period, user can operate the printer as normal. There are two charge modes, charger charge mode or USB charge mode (but **notice that two charge modes cannot work together**).

2.8.1 Charger charge mode

Plug the charger to the 100-240V~50/60Hz power slot, and then connect it with the printer power port, then the charge LED will light up, red color indicates that charging in progress, green color indicates that the power charging is complete.

2.8.2 Charger charge mode

Connect the USB Mini port side of the cable to the printer, the A side (bigger side) with PC, then the charge LED will light up, red color indicates that charging in progress, green color indicates that the power charging is complete.

2.9 Configure settings

During the normal running state[1] of the printer, hold down the power button for about 1 second, then the buzzer will give out a beep, release the power button, then, the printer is entered configuration mode.

Under the configuration mode[2], user can use the power button and the feed button to configure the settings of printer, the printer will print out the information of the settings and remind user to continue[3].

Notes: [1] Under abnormal state (error indicator "ERR" flickers), printer cannot enter configuration mode

[2] Under configuration mode, DO NOT SEND ANY DATA TO PRINTER VIA BLUETOOTH OR USB, OR ELSE THERE WILL BE A CONFLICT ON REMINDER INFORMATION

[3] Under configuration mode, please make sure that the paper roll is correctly installed

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2.9.1 Language selection

The first option to configure is the language, the steps to configure language option is shown in the A Step in Figure 2-6, press the feed button for English information, press the power button for Chinese information.

2.9.2 Self test and function settings

After the language selection, next is to select to print out "Test page" or configure "Settings".

2.9.2.1 Self test

User can press the feed button to print out a self test page, as Step C in Figure 2-6 shows. On this test page, all information and current settings about the printer will be listed out clearly.

Figure 2-5 is an example test page, user can find out parameters like Bluetooth printer name and ID, pairing password, binding host name and ID (if there is no binding host, then it will be "No binding"), and the working states of the printer (such as grayscale, speed, and battery power level).
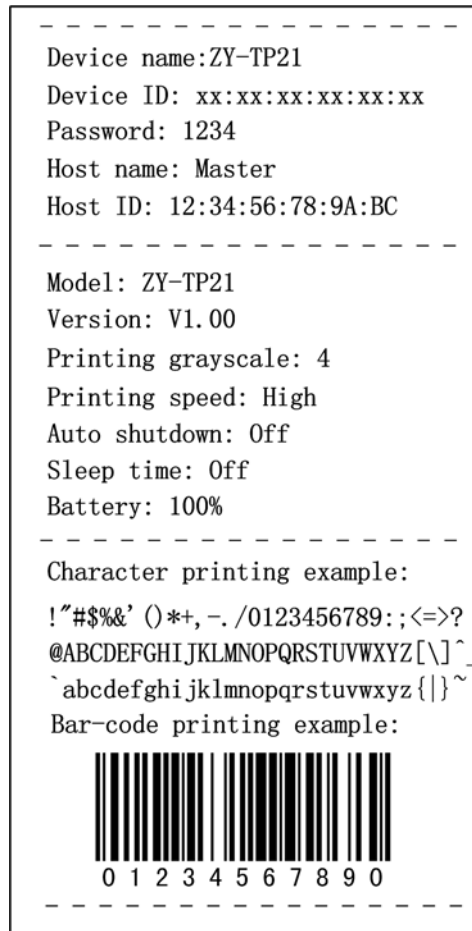
```
 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Device name:ZY-TP21
Device ID: xx:xx:xx:xx:xx:xx
Password: 1234
Host name: Master
Host ID: 12:34:56:78:9A:BC
 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Model: ZY-TP21
Version: V1.00
Printing grayscale: 4
Printing speed: High
Auto shutdown: Off
Sleep time: Off
Battery: 100%
 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Character printing example:
!"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
`abcdefghijklmnopqrstuvwxyz{|}~
Bar-code printing example:
```

0 1 2 3 4 5 6 7 8 9 0

```
 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```

Figure 2-5: Example Test Page

2.9.2.2 Settings

Press the power button can select configure settings, as Step D in Figure 2-6 shows. The steps to configure settings are shown in Step D and E in Figure 2-6:

● Power button in the settings configuration mode will work as a "next parameter" button. Press it to configure next parameter.

● Feed button in the settings configuration mode will work as a "switch option" button; it will switch the settings of the current parameter. For example, for the configuration of auto shutdown mode, if the current setting is "ON", press the feed button once can switch its current setting to "OFF".

After the configuration, the settings will be saved automatically. So on the next power up, the setting will still be effective. Figure 2-7 listed out the configurable functions and parameters.

1. Auto Shutdown

   The default setting of the auto shutdown is "OFF", if user turn this function on, then after 1 hour's wait, if still there is no operations, the printer will be shutdown automatically

2. Sleep mode

The default setting of the sleep mode is "Off", if user sets it to a different mode, then the printer will enter sleep mode after the specify delay when there is no operation.

3. Host binding

The default setting for host binding is "No binding", if user binds a host, then the printer can only communicate with the binding host. Other host can pairing with the printer, but cannot connect to it.

4. Grayscale

The default grayscale level is "4", there are 8 levels in total, higher value means darker. This option is designed to suit for different papers, if user found that the result of printing is too shallow, just increase this value to get darker grayscale.

5. Printing speed

There are "High", "Medium", and "Low" 3 levels of printing speed, lower printing speed results in lower power consumption, user can select this speed based on practical requirement. The default printing speed is "High".
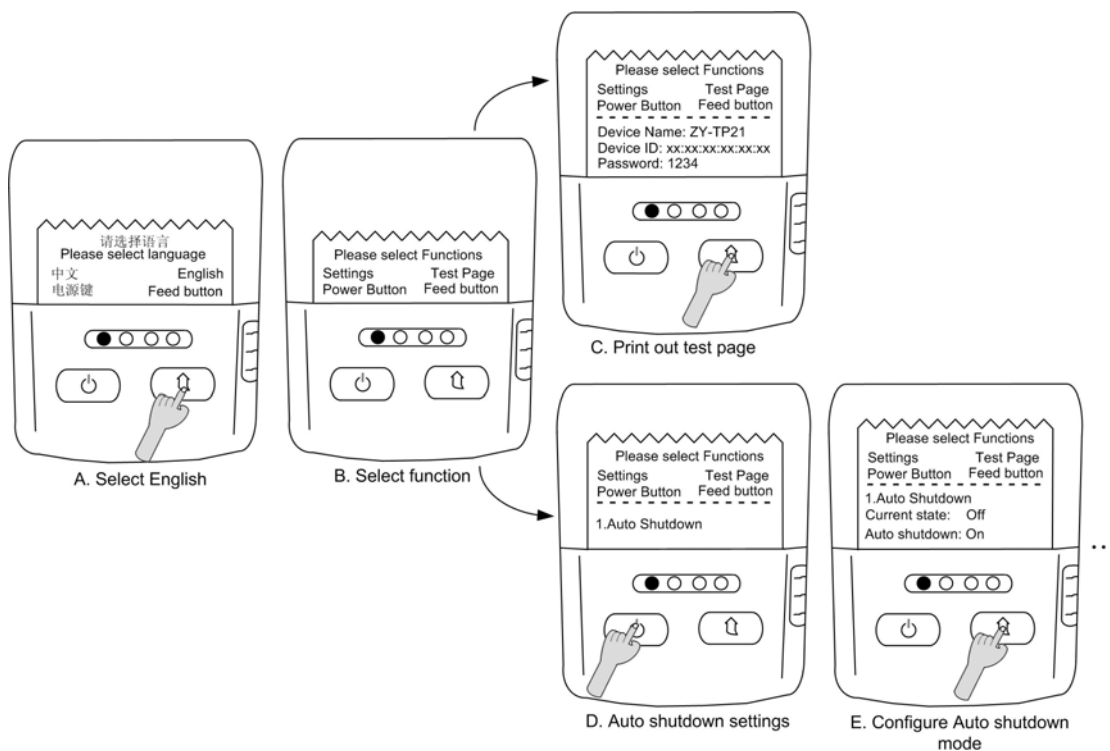

Figure 2-6: Steps to configure settings

```
Please select functions

Settings                Test Page

Power button            Feed button
- - - - - - - - - - - - - - - - - - - - -

1. Auto shutdown
Current state:   Off

Auto shutdown: On        ⎫  Press Feed Button
                         ⎬  to switch settings
Auto shutdown: Off       ⎭
- - - - - - - - - - - - - - - - - - - - -

2.Sleep mode settings
Current state:
Sleep time: Off

Sleep time: 5 mins       ⎫
                         ⎪
Sleep time: 10 mins      ⎬  Press Feed Button
                         ⎪  to switch settings
Sleep time: 20 mins      ⎪
                         ⎭
Sleep time: Off
- - - - - - - - - - - - - - - - - - - - -
```

```
3.Host binding settings
Host name: No binding

Pleas pair with printer
Wait for pairing...      ⎫  Press Feed Button
                         ⎬  to switch settings
Cancel binding           ⎭
- - - - - - - - - - - - - - - - - - - - -

4.Grayscale Settings
Current grayscale: 4

Grayscale settings: 5    ⎫  Press Feed Button
                         ⎬  to switch settings
Grayscale settings: 6    ⎭
- - - - - - - - - - - - - - - - - - - - -

5.Speed settings
Current speed: High

Speed mode: Low          ⎫
                         ⎪  Press Feed Button
Speed mode: Medium       ⎬  to switch settings
                         ⎪
Speed mode: High         ⎭
- - - - - - - - - - - - - - - - - - - - -
Settings is completed
```

Figure 2-7: Settings list

2.10 Communication

2.10.1 USB Communication

The printer can be connect to a PC through a USB communication cable, then it can work as a PC printer to print out documents or papers. The PC driver for the printer can be downloaded from: http://www.zlgmcu.com/zlg/print/ZY-TP21.asp

2.10.2 Bluetooth communication

2.10.2.1 Pairing

The printer can select the Bluetooth wireless communication. the printer will work as a slave device, the connection will be initiated by hosts. The procedure of pairing is:

- Power on the printers for pairing, to avoid confuse names, please shutdown other unused printers.
- At host side, search the external Bluetooth devices. If there are over one printer are working nearby, their IDs will all appear on the list, just select the required ID (To get this ID, user can print out a test page, the ID of the printer is listed on it, related operation can refer to Section 2.9.2.1).
- At host side, select the device named "ZY-TP21";
- Input the password, which is "1234"
- Wait until the pairing is completed.

After a successful pairing, the printer can also pair with other hosts, each printer can pair with maximum 8 hosts. For more hosts, later host on the pair list will flush up the early host.
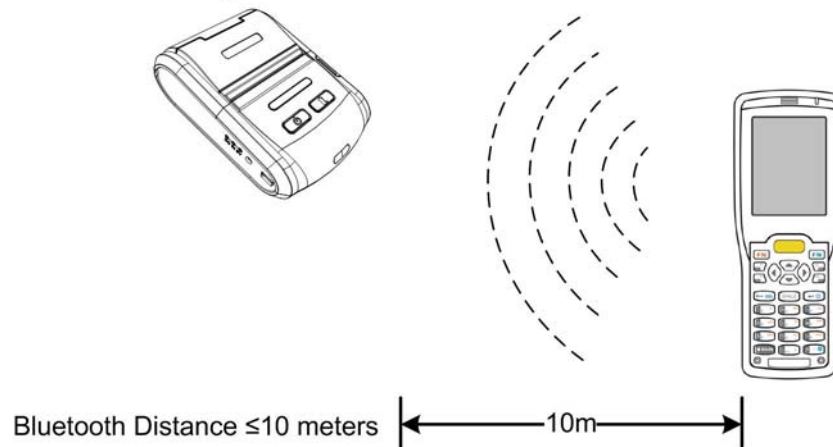
Device Name: ZY-TP21
Pairing Password: 1234

Bluetooth Distance ≤10 meters ——10m——

Figure 2-8: Bluetooth communication

2.10.2.2 Connection

After a successful connection, user may perform data transmission. Pairing is necessary before connection, but if the pairing with a host is successful but cannot connect with it, user should check whether the printer had already specified a binding host; refers to Section 2.9.2.1 for related operations.

2.10.2.3 Printing

After successful connection, hosts that support Bluetooth virtual serial port (such as cell phone, PDA, laptop, and etc.) can send data to the printer for printing through Bluetooth virtual serial port. Host does not support virtual serial port cannot controls the printer; please contact the supplier of your host to get this function.

2.10.2.4 Binding

After binding the printer to a host, then the printer can only be connected to this host. Other host can pair with the printer, but cannot connect with it for communication. This function can prevent interferences from other hosts.

If binding is not necessary, user can cancel binding in the configuration mode, please refer to Section 2.9.2.2 for related operations.

2.11 Status indication

2.11.1 LED indicators

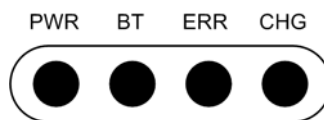There are 4 LED indicators on the printer, as Figure 2-9 shows.

Figure 2-9: LED indicators

The states of the LEDs are listed in Table 2-1.

Table 2-1: LED indicator states

LED	LED state	Printer state
Power indicator (PWR)	Light up still	Power supply is normal
	Flicker once in a period	Sleep mode
	Flicker twice in a period	Low on battery
Bluetooth indicator (BT)	Flickers constantly	Disconnected
	Flicker once in a period	Pairing
	Flicker twice in a period	Connecting device
Error indicator (ERR)	Flicker once in a period	Abnormal battery voltage
	Flicker twice in a period	Short of paper
	Flicker constantly	Over heat protection
Charging indicator (CHG)	Red still	Charging
	Red flickering	Charge error
	Green still	Charge is completed

2.11.2 Buzzer

The buzzer cooperates with the button to give out indications on printer state, Table 2-2 listed out the buzzer beeping events.

Table 2-2: Buzzer beeping

Printer state	Buzzer beeping
After power up	Beep twice
Enter configuration mode	Beep once
Wake up from sleep mode	Beep once

Chapter 3: Parameters

3.1 Printer parameters

The parameters of the printer are listed in Table 3-1, Table 3-2, and Table 3-3.

Table 3-1: Printer parameters

Printing mode	Line thermal printer
Density	8dots/mm
Dots per line	384dots/line
Width	48mm
Paper width	57±1mm
Printing Speed	70mm/sec (at enough power)
Font	Other languages: Font size: 12×24 dots (1.5×3mm) Supports : 16 international fonts, 12 types of code pages Chinese: Font size: 24×24 dots (3×3mm) Supports: GB18030
Printing Images	Support "Vertical modeling" and "Horizontal modeling" image printing mode
1D Barcode	Support 10 common 1D barcodes: UPCA, UPCE, EAN13, EAN8, CODE39, ITF25, CODABAR, CODE93, CODE128, and EAN128.
2D Barcode	Not supported.
Sticker tag	Support
Communication	Blue tooth, USB
Input buffer	4K Bytes
Platen detect	Not support
Out of Paper Detect	Support
Over temperature protect	Support
Paper cutter	Not support
Power supply	Lithium Battery 7.4V 1100mAh
Standard	CE RoHS

Table 3-2: Physical parameters

Size	117×83×44mm
Weight	200g (Including battery, but not including paper roll)
Paper Roll Diameter	≤40mm
Interface	Blue tooth, USB (Mini-USB interface)

Table 3-3: Environmental Parameters

Working Temperature	-10ºC ~ 50 ºC
Working Humidity	20% ~ 85%
Storage Temperature	-20ºC ~ 70ºC
Storage Humidity	20% ~ 85%

3.2 Bluetooth parameters

Table 3-4: Bluetooth parameters

Basic Parameters	**Specification**	Bluetooth 2.0
	Frequency Range	2.4GHz
	Transmit distance	Class 2 (10m)
	Bluetooth Service	SSP
	Bluetooth Device Type	Printer Type (08 06 80)
	Initial Paring Password	1234
SPP Parameters	**Data format**	Number of Data bits: 8, Stop bit: 1 Parity bit: None
	Speed	115200 bps
	Flow control	Support

3.3 Lithium battery parameters

Table 3-5: Lithium battery parameters

Specification		GB1002
Type		Lithium battery
Rated Voltage		7.4 ± 0.5V
Rated Capacity		1100 mAh
Discharge Cut-off Voltage		6.0 ± 0.5V
Charge voltage limit		8.4 ± 0.5V
Maximum Charging current		1.0C
Working Temperature	**Charge**	0ºC ~ +35 ºC
	Discharge	-20ºC ~ +60 ºC
Storage temperature		-20ºC ~ +35 ºC
Relative Humidity		65 ± 20%

3.4 Charger parameters

Table 3-6: Charger parameters

Type	NLB080090W1U
Input	100~240 VAC 50/60Hz 0.4A(max)
Output	9 V/800 mA 7.2W
Polarity	Positive inside, negative outside
Idle Power Consumption	<0.5W
Working temperature	0~+40℃
Storage temperature	-20~+85℃
Standard	GS CE

3.5 Paper specs

There is a photoelectric sensor inside of the printer to detect sticker tag boundary, its position on the printer are shown in Figure 3-1. So please select proper size thermal sticker tag paper according to the sensor position.
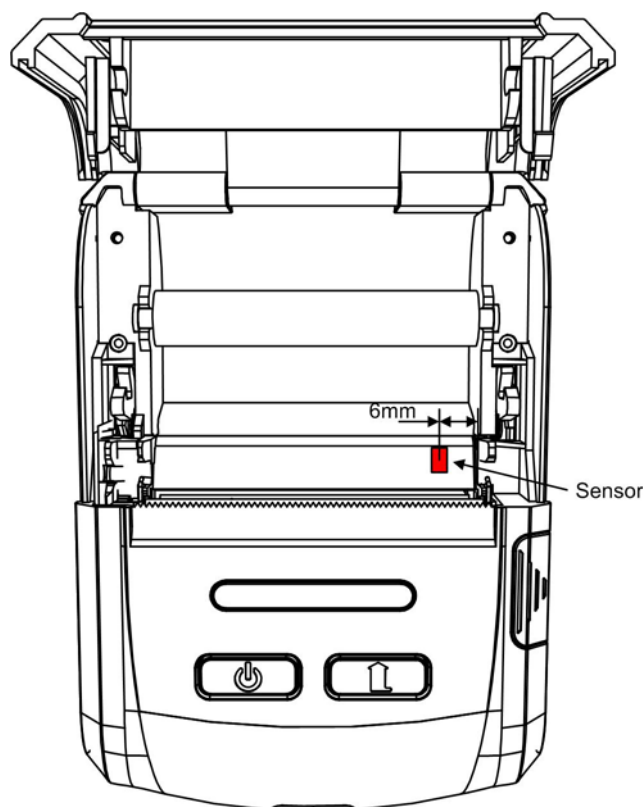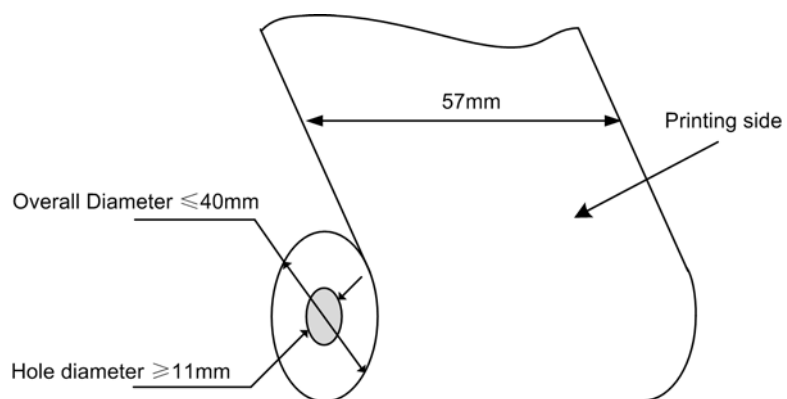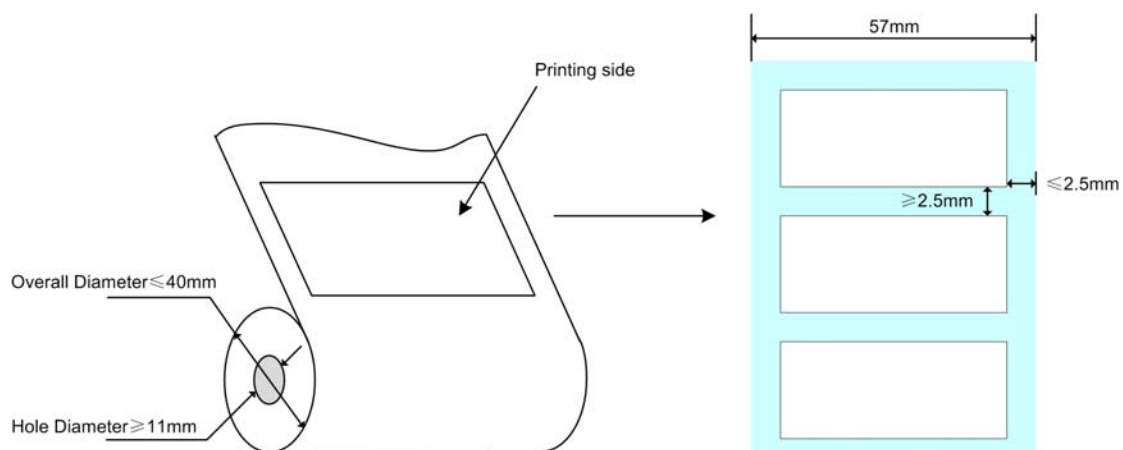

Figure 3-1: Sensor position

Printer can print on normal thermal paper or thermal sticker tag paper. The specifications of normal thermal paper are shown in Figure 3-2. The specifications of thermal sticker tag paper are shown in Figure 3-3.

Figure 3-2: Normal thermal paper specification

Figure 3-3: Thermal sticker tag paper specification

Chapter 4: Notices

4.1 Working conditions

- Though the printer can work stably under -10ºC~50ºC environment, but high temperature environment (>45ºC) or low temperature environment (<5ºC) may affects the printing quality.
- High humidity (>85%) or low humidity (<20%) environment may also affects the quality of printing.
- Low quality paper or paper over long time storage may also affects the printing quality, even damage the printer.

4.2 Notices on operations

- Do not open the paper cover during the printing, or else the printer may not work normally.
- Do not touch the printing core of the printer when it is printing or just finish printing, or else its high temperature may cause scald.
- If the printer does not function properly or have no response, do not try to use it anymore, because there is a chance that it may cause fire or electric shock. Turn it off and remove the power supply, and contact your supplier for repair
- Do not remove the USB cable during printing, or else the printing result may be incomplete.

4.3 Storage

- Please store the printer to an environment with temperature between -20ºC and 70ºC, and relative humidity between 20% and 85%.
- If the printer is not used for a long time, please take out its battery and store them separately, because that if a battery is not used for a long time, it may become ineffective or even have liquid leakage which may damage the printer.
- Do not remove the wrapper if the printer is not used.
- The storage time of normal thermal paper is short, so for printings that require long term storage, such as invoices, please select a long durability thermal paper.
- For longer storage time, the storage site of thermal paper should avoid direct sun light or high temperature.

4.4 Notices on battery usage

- This printer only uses the battery and charger provided by our company, or else it may cause damage the printer, or battery leakage, fire or even explosion.

- Please use the battery under normal indoor condition with temperature between -20ºC and 35ºC, and relative humidity between 45% and 85%.
- Stay away from heat source and high voltage.
- Keep the battery away from children, do not drop it or throw it.
- Do not short the positive and negative connector of the battery.
- The battery liquid is corrosive, if it drops to your skin or cloth, please wash them with clean water immediately, if it unfortunately it goes into your eyes, please wash your eyes with large amount of clean water and seek medical attention immediately.
- Do not throw a broken or useless battery to water or fire.

4.5 Maintenance of the printer

Surface cleaning

Use a wrung wet fabric, softly cleans the surface and the paper box of the printer

Printer core cleaning

Printer core should be cleaned periodically, especially when the printing quality is apparently dropped.

Use absorbent cotton dipped with absolute alcohol, softly cleans the two dark areas marked in Figure 4-1, until all of them are clean.
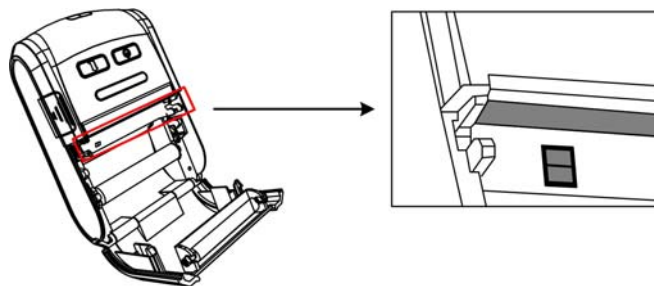

Figure 4-1: Areas in the printer core that require cleaning

Flood condition

If water is leaked into the printer, please shut down it immediately and take out the battery, then let it dry naturally.

Not use in a long time

If user will not use the printer recently, please take out the battery and put it separately.

Chapter 5: Errors and solutions

Common errors and solutions are listed in Table 5-1.

Table 5-1: Errors and solutions

Error	Solution
Printer normal running, but cannot print out texts	Please install the paper roll properly, refer to Section 2.1.2 for detail operations.
Bluetooth pairing failure	Please make sure you had entered the correct password "1234" and check whether Bluetooth ID is matched
Cannot print after pairing	Check whether the printer has a binding host, refer to Section 2.9.2.2 for detail operations
Printed text not clear	Set grayscale level to higher value (higher for darker), refer to Section 2.9.2.2 for detail operations Clear printer core, check Section 4.5 for detail operations.

Chapter 6: Printer commands

The printer uses "ESC/POS" commands, please refer to our document: "*ZLG ESC/POS Application Guide*"

Download address: http://www.zlgmcu.com/zlg/print/ZY-TP21.asp

Chapter 7: Physical Dimensions
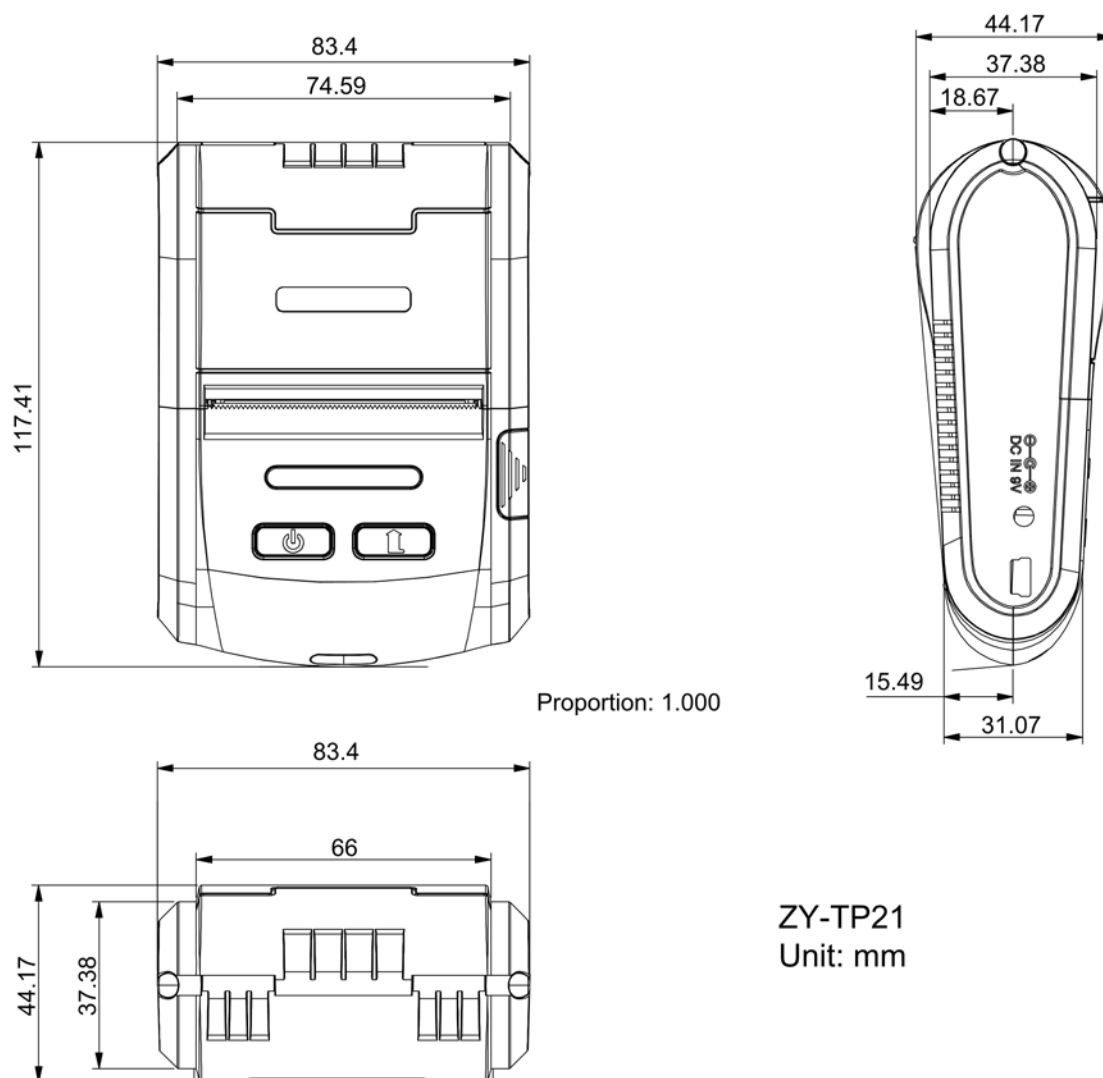

Proportion: 1.000

ZY-TP21
Unit: mm

Figure 7-1: Physical dimensions of ZY-TP21

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